

1082,620

# PATENT SPECIFICATION

DRAWINGS ATTACHED

1082,620



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## COMPLETE SPECIFICATION

### Swimming Pool Vacuum Cleaner

I, ROBERT CONRAD, of 1135 Rose Street, Burbank, State of California, United States of America, a citizen of the United States of America, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a swimming pool vacuum cleaner of a type which does not use a brush of the bristle type, nor a water pressure nozzle.

The average vacuum brush provided with bristles is moved through the medium of a long handle by an operator standing at the edge of a pool. Such brush movement against the pool wall and floor disturbs the water and any debris on the wall and floor rises within the water with resultant inefficient cleaning of the pool.

My invention has for one of its objects a swimming pool vacuum cleaner which does not create disturbance in the water sufficient to cause suspension of debris therein, and which cleaner is so constructed that the action of cleaning the pool is continuous without intermittent stops and which will readily pick up heavy debris such as sand and leaves.

A further object is the provision of a vacuum cleaner for swimming pools which washes a swimming pool from debris by hydraulic washing action alone without the use of a brush.

A further object is the provision of a swimming pool vacuum cleaner having a head adapted to be moved over the pool walls and floor and wherein a swirling action of the water is created beneath the head to dislodge debris from the swimming pool enclosure effectively and efficiently.

A further object is the provision of a swimming pool vacuum cleaner which provides a hydraulic swirling washing action.

Other objects include a swimming pool vacuum cleaner which is inexpensive in cost

of manufacture, readily constructed and efficient in use and operation.

Other objects of my invention will appear as a detailed description of the invention is set forth.

#### IN THE DRAWING:

Figure 1 is a fragmentary, perspective view of an embodiment of my invention;

Figure 2 is an enlarged fragmentary top plan view of the head of the vacuum cleaner;

Figure 3 is a bottom plan view of the head shown in Figure 2;

Figure 4 is a fragmentary transverse sectional view on the line 4—4 of Figure 2;

Figure 5 is a cross sectional view on the line 5—5 of Figure 2;

Figure 6 is a fragmentary, sectional view on an enlarged scale of the head; and

Figure 7 is a diagrammatic view illustrating the flow path of water beneath the vacuum head during operation thereof.

Referring now to the drawing, the swimming pool vacuum cleaner includes a vacuum head 1 to which is connected a hose 2 leading to a source of vacuum such as a vacuum pump, not shown, and 3 is a handle secured to the vacuum head 1 for moving the vacuum head over a pool floor or the side walls of a pool.

The vacuum head 1 comprises a flat or plane plate 4 of segmental form in that it has a substantially arcuate leading edge 5 and a straight trailing edge 6. The bottom or base surface 7 of the plate 4 is surrounded by an arcuate marginal flange 8 bounding the arcuate leading edge 5 and a straight flange 9 bounding the straight edge 6, thus providing a depressed base. Extending transversely of the base 7 is a flat or plane surfaced arcuate embossment 10, the bounding edges 11 and 12 of which generally conform to the arcuate edge 5 of the plate 4. Extending from the top surface 13 is a tubular throat member 14 which is positioned substantially intermediate the plate 4 both transversely and laterally thereof, as shown. The tubular throat member

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14 extends through the base 7 of the plate, as shown by Figure 5, to provide a mouth 14a.

5 The embossment 10 is provided with spaced surface grooves designated generally as 15 which communicate on one side; to wit, the arcuate edge 11 of the embossment, with the elongated arcuate groove 16 formed in the base 7 and positioned between the arcuate edge 11 of the 10 embossment and the marginal flange 8. There is an elongated straight groove 17 of uniform depth between the marginal flange 9 and the arcuate edge 12 and formed in the base 7. Thus the embossment divides the base 7 trans- 15 versely into two areas, one of which includes groove 16 and the other a flat area having groove 17. Such a construction of the base of the head results in high and low planes as shown in Figures 4 and 6.

20 The vacuum head plate 4 is adapted to be supported by rollers of which in the present instance there are three, as shown at 25, 26 and 27. The rollers 25 and 26 are offset from the marginal edge 6 of the plate 4 while the 25 roller 27 extends beyond the arcuate edge 5 and substantially central of the plate 4 to provide a tricycle support. The construction is such that the rollers are carried within the wells of fenders 30. Thus, referring to Figure 30 the fenders extend above the top surface of the plate 4 and are curved to conform to the curvature of the rollers, as shown at 31. The outer ends of the fenders terminate 35 above the periphery of each roller, as shown at 32. Each fender includes side walls 33 and 34 which are integral with the marginal flanges 8 and 9. Each side wall is provided with an open ended slot 35 which is normal to the plane of plate 4 and the rollers are mounted 40 upon suitable axles 36 which extend through the aligned slots 35 and are provided with means 37 for holding the axles at adjusted heights within the slots. Thus the axle may comprise a bolt having a smooth shank portion 45 for the rollers, a head, and a screw threaded portion receiving a nut whereby the axle may be held in a selected position relative to the fender side walls. In this manner, the vacuum head may be raised or lowered relative to 50 a pool surface to be cleaned.

In the showing of the drawing I have provided a pair of lugs at 40 which extend from the tube 14 as shown in Figure 2 and a yoke 41 bridges the lugs 40 and is held thereto 55 by the means shown at 42 which may comprise a headed bolt passed through aligned openings in the yoke and the lugs and secured by a nut carried on threads of the bolt. The handle 3 is fastened to the yoke bracket as shown 60 in Figure 1.

The operation, uses and advantages of my invention are as follows.

65 Having made an adjustment as to the height of the vacuum head 1 above a surface to be cleaned by means of the adjustability permit-

ted the rollers 25, 26 and 27, and assuming that the tube 2 is connected to vacuum apparatus which draws water therethrough to be filtered so as to remove debris therefrom, the operator by means of handle 3 moves the 70 vacuum head over the surface which may be a pool floor or a side wall thereof, the water ordinarily being passed through the tubular suction throat 14 and into the flexible tube 2 at approximately sixty gallons per minute. 75 The movement of water between the vacuum head base and the pool floor or wall causes a hydraulic swirling washing action substantially confined to the area beneath the base of the vacuum head due to the arcuate grooves 15 in the embossment 12 forming flow paths for the water. This kind of confined swirling washing action substantially prevents suspension of debris in the water outside of the confines of the base plate, since said water 85 is simply being sucked in below the marginal flanges 8, 9 and caught up in the swirling movement beneath the base plate toward the mouth 14a of the tubular throat member 14. I have found that the low profile type cleaner head of my invention is superior to any brush 90 construction type vacuum cleaner which only disturbs the debris and causes suspension thereof in the water as the brush is moved over a pool floor or wall. Furthermore, brushes 95 wear rapidly and the present invention does not provide any means adapted to engage the floor or wall other than the rollers at 25, 26 and 27. The base of the vacuum head may be raised to different levels by the adjust- 100 ment provided for the rollers so that almost any character debris such as sand and leaves may be readily washed from the pool floor or wall. The fender arrangement by rising above the top surface of the vacuum head 105 allows ready adjustment of the rollers to lift the vacuum head to different levels and particularly levels for the base of said head. In this manner the maximum efficiency of the swirling action for the head can be ascertained 110 for a given pool condition.

The high and low planes for the base surface of the head resulting from the raised embossment 10 and the grooves 16 and 17 in the base surface have a direct effect on the flow 115 of water passing inwardly under the marginal flanges. The direction of water flow inwardly of the head is illustrated in Figure 7 by the arrows at 50, 51, 52, and 53. This construction provides a cleaner which attains the objects 120 of the invention.

#### WHAT I CLAIM IS:—

1. A swimming pool vacuum cleaner, characterized in this, that a head in the form of a substantially flat plate with a marginal 125 flange thereon is provided with means for supporting said head for movement in spaced relation along the wall of a swimming pool to be cleaned, and that the surface of said plate thus facing the pool wall is provided with 130

- an embossment provided with spaced apart transverse arcuate grooves extending partially around a tubular throat adapted to be connected to a source of vacuum, whereby when the head is placed in the water containing pool with said means for supporting the head in engagement with a wall thereof, the water between the head and said wall will be caused to perform a swirling action toward and into said tubular throat.
- 5      2. A swimming pool vacuum cleaner as set forth in claim 1, in which said head is provided with adjustable height rollers for supporting and moving said head along a pool wall or floor surface at the desired distance therefrom.
- 10      3. A swimming pool vacuum cleaner as set forth in claim 1, in which the tubular throat interrupts the continuity of the embossment.
- 15      4. A swimming pool vacuum cleaner as set forth in claim 1, in which said plate surface is provided with an arcuate groove positioned between the marginal flange and an arcuate edge of the embossment.
- 20      5. A swimming pool vacuum cleaner as set forth in claim 1, in which said base of the plate is provided with elongated grooves positioned between the marginal flange and the embossment to provide high and low planes of the base surface.
- 25      6. A swimming pool vacuum cleaner as set forth in claim 1, in which said arcuate grooves in said embossment are arranged concentrically about the axis of the tubular throat.
- 30      7. A swimming pool vacuum cleaner substantially as described and illustrated in the accompanying drawing.
- 35

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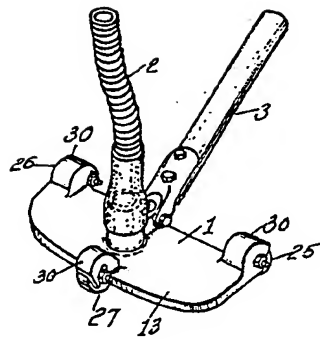


FIG. 1.

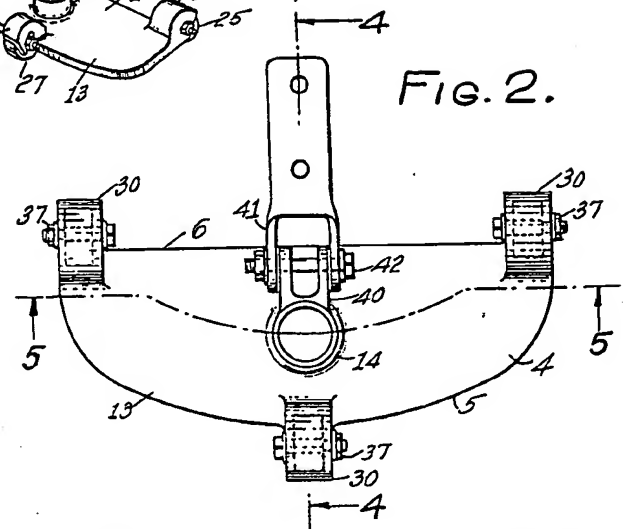


FIG. 2.

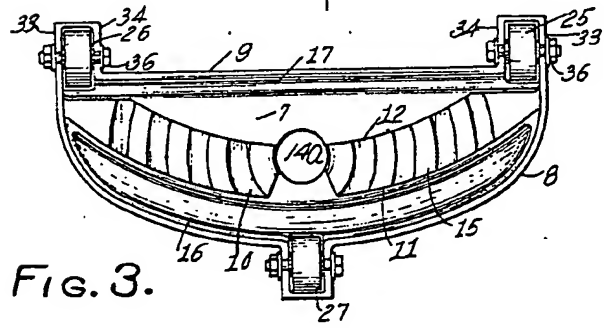


FIG. 3.

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COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale  
Sheets 1 & 2

2.

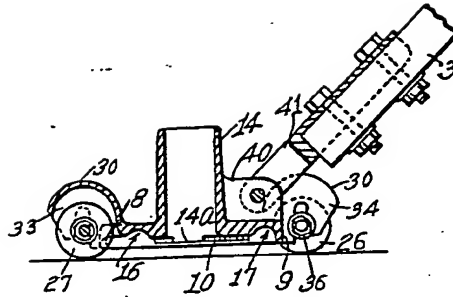
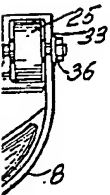
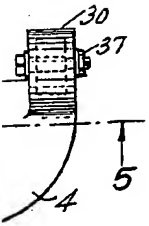


FIG. 4.

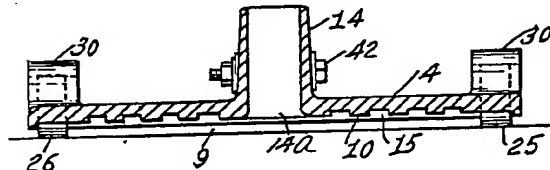


FIG. 5.

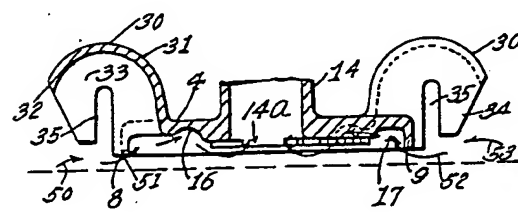


FIG. 6.



FIG. 7.

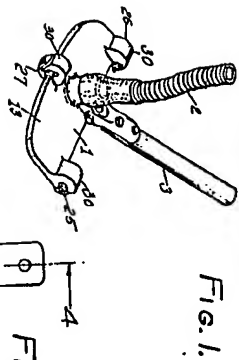


Fig. 1.

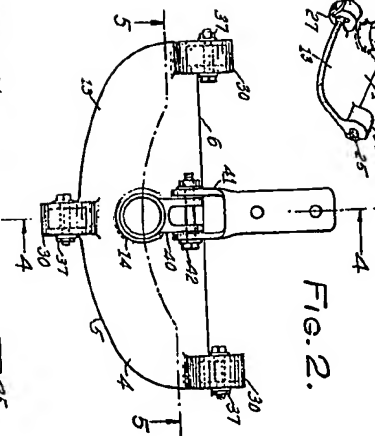


Fig. 2.

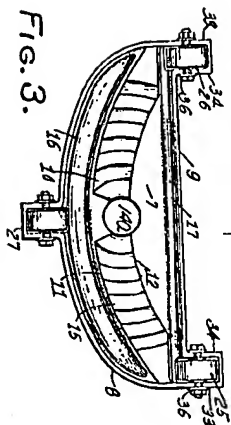


Fig. 3.

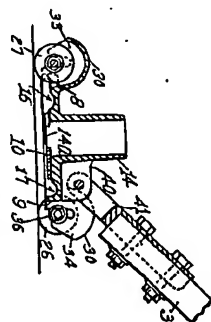


Fig. 4.

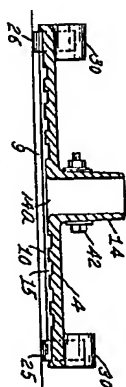


Fig. 5.

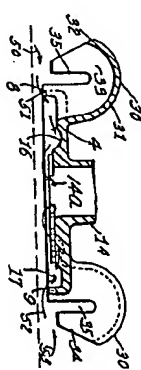


Fig. 6.



Fig. 7.